

**National Marine Fisheries Service
Response to Comments on
Draft Interim Regional Recovery Plan for the Washington Management Unit
of the Lower Columbia River Chinook, chum, and steelhead ESUs**

On April 20, 2005, the National Marine Fisheries Service (NMFS) solicited review and comment on a Draft Interim Regional Recovery Plan (Plan) for the Washington Management Unit of the Lower Columbia River Chinook salmon, Lower Columbia River chum salmon, and Lower Columbia steelhead ESUs (70 FR 20531; see <http://www.nwr.noaa.gov/Publications/FR-Notices/2005/upload/70frn20531.pdf>).

In response, we received comments from six individuals or entities. Below is our response to those comments. For additional information on development of a final recovery plan for these ESUs, see “ESA Recovery Planning for Salmon and Steelhead in the Willamette and Lower Columbia River Basins: Status of Planning Effort and Strategy for Completing Plans,” available at <http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Willamette-Lower-Columbia/upload/W-LC-Strategy.pdf>.

A number of comments related to the role of hatchery fish in recovery and the Plan’s treatment of hatchery fish and hatcheries. These comments included requests that the Plan clarify its vision, goals, and strategies as they relate to hatchery fish and suggestions that the Plan contain more detail on hatcheries and their impacts (including more detail on specific hatchery programs, hatcheries as a factor for decline, and the role hatcheries will play in recovery).

NMFS believes that the Plan’s vision, goals, and strategies as they relate to hatchery fish are sufficiently clear and consistent with the Endangered Species Act. We also believe that the Plan accurately describes current scientific views on the role of hatcheries in the decline of salmon and steelhead populations as well as their potential role in recovery. The level of detail in the Plan is adequate as a *starting point* for additional assessment, expected to take place as the Plan is implemented, to evaluate individual hatchery programs as they relate to population recovery goals and to identify both short-term and long-term strategies for the role of hatcheries in recovery of each population and ESU.

As indicated in its April 15, 2005, Supplement to the Plan, NMFS supports the Plan’s vision of healthy, harvestable salmon and steelhead, “as long as harvest, hatcheries, and other human activities support ESA recovery goals.” In the Supplement, NMFS also stated that we agree

with the Plan’s approach to artificial propagation. The Plan proposes to modify hatchery programs to support integrated, comprehensive protection and restoration of depleted populations while minimizing impacts to wild fish and also providing fish for harvest. The Plan supports the development of Hatchery and Genetics Management Plans (HGMPs) that describe needed changes and modifications in hatchery programs. The Plan also identifies (in the subbasin

chapters of volume II) specific modifications to hatchery programs and proposals for new programs. NMFS has not yet reviewed all these specific proposals in detail and anticipates working with the LCFRB and the Washington Department of Fish and Wildlife to further explore and evaluate the specific proposals prior to formal decisions.

The Plan lays out its vision of the potential role of hatcheries in recovery in a series of 4 strategies, 11 measures, and 31 actions. Many of these actions involve significant changes to historical hatchery practices, some of which are already underway and will continue, consistent with the Plan's overall direction. The Plan also provides detail on current hatchery production affecting each population and proposed future roles of hatchery production (in the subbasin chapters of volume II and in appendix A). In addition, the Plan considered current and potential roles of hatchery fish in developing its recovery scenario and assigning each population a target status. For example, genetic legacy populations identified by the Willamette-Lower Columbia Technical Recovery Team (WLC TRT) were targeted for high viability, and population objectives were affected by considerations of whether hatchery influence could reduce the likelihood of restoring a population to high viability. (The TRT defined genetic legacy populations as those with minimal hatchery influence or those exhibiting important life history characteristics no longer found throughout much of their historical range.)

Comments noted that an evaluation of specific hatchery programs is missing from the Plan and that such an evaluation would be necessary to evaluate the goals of hatcheries as they relate to population recovery goals. We agree that such an evaluation is needed. A hatchery work group composed of NMFS, US Fish and Wildlife Service, Washington Department of Fish and Wildlife, and Lower Columbia Fish Recovery Board (LCFRB) staff will conduct additional analysis and evaluation in developing a comprehensive implementation plan for the hatchery actions identified in the Plan. Furthermore, as Hatchery and Genetics Management Plans (HGMPs) are developed and implemented, the HGMPs will be evaluated as they relate to the recovery goals of the Plan and modified as needed. Many hatchery programs in the Lower Columbia basin are funded under the Mitchell Act. The Environmental Impact Statement currently in development for Mitchell Act funding will also evaluate hatchery programs as they relate to the goals of the Plan.¹

More detailed evaluation of hatchery programs and recovery goals will involve decisions regarding the role of hatcheries, both short-term and long-term, in the recovery of each population addressed by the Plan. The role that hatcheries play in recovery is dependent on specific situations and can change over time. For example in the Cowlitz River basin, hatchery spring Chinook, coho, and late winter steelhead are being used in the short term to recolonize the upper basin above Cowlitz Falls Dam.

¹ Additional specific information on individual hatchery programs is available in the "Salmonid Hatchery Inventory and Effects Evaluation Report" developed by the NMFS Salmon Recovery Division, Hatcheries and Inland Fisheries Branch, in June 2004. The report is available upon request by calling 503-230-5407.

The long-term goal for these populations in the upper basin, as described in the Plan, is for them to become high-viability, low risk populations. As the populations become self-sustaining in the wild, the hatchery program could change to serve a different purpose (e.g., to support fishing) or it could be eliminated altogether. A recovered ESU must have enough natural production to be self-sustaining. Hatchery programs must not impede recovery of any ESU, but hatchery programs and the recovery of salmon and steelhead are not mutually exclusive.

NMFS agrees with comments that the role of hatcheries in conservation and recovery needs to be carefully monitored and evaluated. As the monitoring and evaluation component of the Plan evolves, NMFS will work with the LCFRB and other implementing partners to ensure an adequate hatchery monitoring component. HGMPs will also provide full descriptions of individual artificial propagation programs, their goals, how they will be managed to support recovery, and how the programs will be monitored and evaluated.

A number of comments dealt with the Plan's recovery goals. Some comments questioned the extent to which the goals were based on science and asked for clarification of the scientific basis for the concept that not all historical populations need to be recovered to low risk levels. Another comment related to whether recovery goals would be established only for abundance and productivity and questioned whether the process of setting goals was adequately based in science. Comments also requested clarification or greater specificity in goals, especially with regard to productivity goals and timeframes for measurement.

The goals of the Plan are based on recommendations for viability criteria made in March 2003 by the Willamette-Lower Columbia Technical Recovery Team (WLC TRT). NMFS considered the Plan's goals and the TRT's recommendations in proposing de-listing criteria for the ESUs addressed by the Plan (see the NMFS Supplement to the Plan, pages 16-23, <http://www.nwr.noaa.gov/Salmon-Recovery-Planning/ESA-Recovery-Plans/upload/LCFRB-Supplement.pdf>). Final de-listing criteria will be adopted when plans addressing the full ESUs are complete (as required by the ESA) and have undergone public review and comment.

The WLC TRT is an independent science group convened by NMFS specifically to make science-based recommendations on viability criteria. The WLC TRT's work in turn was based on *Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units* (VSP Tech Memo), a NOAA Technical Memorandum published in 2000 (NMFS-NWFSC-42). These documents both discuss the scientific basis for the concept that not all historical populations need to be recovered. (Both documents are available at <http://www.nwfsc.noaa.gov/>.)

Clearly the most precautionary approach would be for all historical populations to be recovered to low or very low risk status. However, several ESUs historically contained a large number of populations, and it is possible that a subset of the historical populations

can provide an adequate probability of ESU persistence. The VSP Tech Memo provides guidelines for determining how many and which populations are needed for a viable ESU. Using these guidelines, the WLC TRT developed a science-based framework for determining how many and which populations should be recovered to various risk levels.

A number of ESU scenarios would conform to the TRT guidelines for ESU viability. During Plan development, the TRT guidelines, along with other technical information, were used as a framework for stakeholder input on choosing among various possible ESU scenarios. NMFS considers such stakeholder involvement essential to developing recovery plans that will be implemented and successful. Recovery goals must be biologically sound, but where multiple options exist for applying biological guidelines, stakeholder involvement in evaluating social and economic tradeoffs among options is crucial.

With respect to the parameters that will be used to set recovery goals and to evaluate population status, the Plan is again based on the work of the TRT and the VSP Tech Memo. The VSP Tech Memo established population abundance, productivity, spatial structure, and diversity as principal indicators of population status. The TRT recommendations for viability criteria addressed all these parameters, as well as habitat (see Plan I:5-6).

The Plan identified quantified recovery goals at the population scale for abundance and productivity but not for the other VSP parameters, in part because many different combinations of specific parameters can be expected to achieve the overarching population goals. The Plan assumed that improvements in diversity, spatial structure, and habitat would be manifested as abundance and productivity improve (see Plan I:5-6; I:5-23). This approach allows for flexibility in tailoring recovery strategies to the threats and opportunities in each area. As the Plan is implemented, specific benchmark values for spatial structure and diversity may be developed. Current population status was evaluated based on all of the VSP parameters, and future evaluations of population status will be based on these same parameters.

Certain issues and uncertainties related to goals and measurement of progress will continue to be clarified as the recovery plan for the full Lower Columbia River ESUs is finalized. It is clear from the gap between current and desired status that substantial improvements are needed in multiple risk factors to achieve recovery. Immediate actions can begin to address those risks and move toward recovery. Rather than delaying implementation until all technical details of goals and monitoring and evaluation of status are refined, we believe it is critical to proceed with substantive recovery actions immediately. As described above, final de-listing criteria for these ESUs will be adopted when plans addressing the full ESUs are complete (as required by the ESA) and have undergone public review and comment.

We received comments related to level of completeness of the Plan, specifically regarding the feasibility of evaluating plan adequacy in the absence of a full ESU perspective. Other comments questioned the management unit concept and how

recovery planning for the Lower Columbia River coho ESU would be addressed pursuant to the 2005 listing of that ESU as threatened.

As noted in the NMFS Supplement to the Plan, a recovery plan must cover the entire listed entity (species, subspecies, or distinct population segment—i.e., ESU). This Plan covers the Washington management unit of three ESUs. A management unit is a portion of a listed species (ESU) that requires different management due to different threats in certain geographic areas or management by different state, tribal, or local entities. The Washington management unit is the portion of the Lower Columbia River ESUs in Washington State and within the planning area of the Lower Columbia Fish Recovery Board. The management unit designation is an administrative convenience and does not imply special requirements or needs for recovery. De-listing can occur only at the ESU scale after NMFS reaches a conclusion that an ESU is no longer threatened or endangered.

The final ESA recovery plan for the Lower Columbia ESUs will include the Oregon and White Salmon portions of the ESUs. For additional information on development of the final recovery plan for these ESUs, see “ESA Recovery Planning for Salmon and Steelhead in the Willamette and Lower Columbia River Basins: Status of Planning Effort and Strategy for Completing Plans,” available at <http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Willamette-Lower-Columbia/upload/W-LC-Strategy.pdf>.

Meanwhile, we believe that this Plan presents a realistic distribution of recovery effort between Oregon and Washington populations. When the Plan was in development, Oregon participated in developing realistic assumptions about goals for Oregon populations to help address the full ESU perspective. It would be disadvantageous to delay implementation of the actions in this Plan until an ESU-wide plan is available. Immediate implementation of this Plan as an interim regional recovery plan will be beneficial to the affected ESUs.

All recovery plans are living documents based on adaptive management in response to research, monitoring, and evaluation, and the Plan’s commitment to this approach is described in volume I, chapters 7-8, and summarized in the NMFS Supplement to the Plan. We expect this Plan and all recovery plans to rely on continued updates and refinements as our understanding of recovery needs progresses.

When this Plan was completed, the Lower Columbia River coho ESU was not listed. The Plan did address the ESU but not with the same level of analytical detail it applied to the listed ESUs. The Lower Columbia coho ESU was still not listed in April 2005, when NMFS made the Plan available for public comment; thus we did not propose the Plan as an interim regional recovery plan for that ESU. In June 2005, the Lower Columbia River coho ESU was listed as threatened. Oregon expects to complete a recovery plan for Oregon populations of Lower Columbia River coho in December 2006, and the LCFRB is also working to upgrade coverage of coho in its Plan. A draft plan for the full ESU is expected to be available for public review and comment in early 2007.

A number of comments related to the overall approach to Plan implementation. Comments suggested that all agencies and entities should be required to address the consistency of their actions with the recovery plan; they also encouraged the use of incentives and assurances for implementation. Other comments asked for clarification on the relationship of ESA regulatory actions to recovery planning; the level of commitment to implementation; the enforceability of the Plan; and the nature of the 6-year implementation schedules currently in development.

Recovery plans are guidance documents, not regulatory documents. No agency or entity is required by the ESA to implement the recovery strategy or specific actions in a recovery plan. However, the ESA clearly envisions recovery plans as the central organizing tool for guiding each species' recovery. Implementation will depend on the cooperation of a broad array of federal, state, local, tribal, and private entities. NMFS intends to continue working with all these entities on Plan implementation. The Plan is designed to obtain commitments through the development of implementation schedules to be completed by each implementing partner in consultation with the LCFRB and the Recovery Plan Implementation Committee (see the Plan, vol.1, chap. 8). NMFS supports this collaborative approach.

In addition to working to encourage implementation of recovery plan actions, NMFS intends to use recovery plans in other aspects of ESA implementation and as a basis for providing certainty, including legal assurances, to non-federal recovery plan partners.

Recovery plans will provide context and a technical foundation for NMFS decisions. NMFS intends to use completed plans to:

- Ensure an integrated approach to ESA section 7 consultations across all Hs (habitat, harvest, hydropower, and hatcheries)
- Judge the significance of proposed actions relative to the importance of the affected habitat and population(s) to ESU survival and recovery
- Guide and expedite ESA section 7 consultations, HCP approvals, and permitting applications for proposed actions consistent with recovery plans
- Evaluate the degree to which a proposed action is consistent with an applicable recovery plan in making ESA determinations (proposed actions that are consistent with an applicable recovery plan are more likely to be approved; proposed actions that are inconsistent with an applicable recovery plan will have an additional burden to demonstrate that they are nonetheless consistent with section 7 requirements).

Future regulatory reviews under sections 7 and 10 of the ESA can be affected by this Plan. The Plan describes the most significant limiting factors and threats facing each management unit and population as well as the opportunities for improving survival across the Hs. This information will provide important context for evaluating the effects of actions subject to sections 7 and 10 in the Plan area.

Future section 7 consultations can also be affected by the Plan because Federal action agencies should incorporate technical assessment information included in the Plan. For example, biological assessments for section 7 consultations in a given watershed would benefit from incorporating technical information from the Plan. Section 7 consultations could also be affected by the Plan as a result of more effective use of section 7 conservation recommendations. Federal agencies should anticipate that significant improvements in survival are needed to recover listed ESUs. Section 7(a)(1) states that the Federal agencies shall, in consultation with NMFS, utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of listed species. Section 7 conservation recommendations may provide an appropriate vehicle for NMFS to encourage Federal conservation programs in the affected area.

The Plan also provides a framework for providing implementing partners with regulatory certainty or other ESA assurances. Whether NMFS will provide ESA “assurances,” or certainty and regulatory relief, is based on several factors:

1. The Plan’s comprehensiveness, level of detail, and likelihood of achieving desired results;
2. Comprehensiveness and certainty of commitments for implementation as detailed in the 6-Year Implementation Schedules.

NMFS supports the proposal to work toward federal assurances over time, linking the provision of such assurances to the level of specificity and commitment of individual 6-Year Implementation Schedules and the general application of the two factors above. NMFS’ ability to sustain these assurances over time will depend on demonstrated progress in implementation of actions called for in the plan and indications that the actions are having the desired effect.

NMFS also intends to link Pacific Coastal Salmon Recovery Funds (PCSRF) to recovery plans. PCSRF funds are authorized (16 U.S.C. 3645[d][2]) for projects with demonstrable and measurable benefits to recovery of ESA listed salmon and steelhead. Priority will be given for projects that (1) support and implement recovery plans and (2) that resolve the factors limit recovery of ESA listed salmon and steelhead.

One commenter requested that the 6-year Implementation Schedules currently being developed by implementing entities for the LCFRB plan be made available for public review and comment. The LCFRB and the Recovery Plan Implementation Committee will integrate 6-Year Implementation Schedules prepared by the partners into a comprehensive and coordinated 6-Year Regional Action Schedule. Prior to finalizing the regional schedule, the LCFRB will make it available for public review and comment.

Some comments related to how the Plan addressed steelhead. One commenter thought the steelhead population productivity goals should address the function of repeat spawning. Another questioned whether the plan’s treatment of steelhead reflected

current NMFS policy with respect to categorizing both resident rainbow trout and anadromous steelhead as O.mykiss.

In contrast to salmon, which die after spawning, some steelhead return to the ocean after spawning, migrate back to freshwater the following year, and spawn again, a function known as *iteroparity*. The incidence of repeat spawning varies substantially among steelhead populations but is typically much higher among coastal populations, where migration distance to the ocean is relatively short. In the Lower Columbia River steelhead ESU, repeat spawning is estimated to range from 6 to 10 percent. This rate of repeat spawning would not have a significant impact on population productivity. Harvest impacts on wild Lower Columbia steelhead are also relatively low (1 to 7 percent), making effects of fishing on numbers of repeat spawners negligible.

Repeat spawning of steelhead is also implicitly recognized by population productivity and diversity objectives. Population productivity objectives identify long-term average replacement rates that include the contributions of multiple age classes of spawners, including repeat spawners. Repeat spawning in steelhead is also one of a broad spectrum of life history and biological characteristics contributing to the diversity necessary to sustain viable populations and ESUs and captured implicitly in population objectives for life history and genetic diversity.

With regard to NMFS' characterization of the relationship between resident rainbow trout and anadromous steelhead, on January 5, 2006, NMFS announced its final listing determinations for 10 populations of West Coast steelhead in California, Oregon, Washington, and Idaho (71 FR 834), reaffirming the threatened status of Lower Columbia River steelhead. In these final listing determinations, NMFS delineated and listed Distinct Population Segments (DPSs) of *O. mykiss* that included populations of anadromous steelhead only. Consistent with these recent steelhead-only listing determinations, NMFS will continue to emphasize the anadromous life-history form of *O. mykiss* in its planning for the conservation and recovery of West Coast steelhead. For additional background on the January 2006 steelhead listing decision, see the *Federal Register* notice at: <http://www.nwr.noaa.gov/Publications/FR-Notices/2006/upload/71fr834.pdf>

In terms of how the Plan addressed habitat limiting factors, threats, and actions, comments questioned whether impacts of water withdrawals, forestry, and gravel extraction had been adequately addressed and whether the Plan relied too heavily on the use of a single model to identify habitat limiting factors. Comments also recommended inclusion of additional actions addressing mining, instream flows, and barriers.

NMFS believes that the Plan has adequately addressed the impacts of forest management, water withdrawals, and gravel mining. The Plan relies on three existing programs to address the impacts of forest management on fish and their habitat. Management of forestlands within the Gifford Pinchot National Forest is conducted pursuant to the

Northwest Forest Plan. Forest practices on state forestlands are conducted under an HCP issued to the Washington Department of Natural Resources. Forest practices on private lands are governed by the state's forest practice rules that implement the Forest and Fish Report. NMFS believes these management and regulatory approaches will provide adequate protection as well as active and passive restoration of riparian area and watershed processes. The effectiveness of these approaches will be evaluated and the approaches revised as necessary through adaptive management processes.

With regard to stream flows and water diversions, the Plan refers to the watershed management plans developed pursuant to the State Watershed Management Act (RCW 90.82). Many streams in the region have been administratively closed to further surface water diversion by the Washington Department of Ecology. Under the provisions of the draft watershed management plans for the region, all streams would be closed to further diversion. Except in areas under tidal influence, ground water reservations were developed to meet future population growth expectations. In general, these reservations attempt to limit habitat loss to no more than 1 percent. Moreover, with the exception of wells for individual residential use, issuance of rights for utilization of reserved water requires acquisition of upstream rights equal to one half the right being granted as well as habitat restoration measures. In addition to these restrictions, minimum in-stream flows have been developed, as have both high and low flow targets. These measures should provide for the protection and the potential improvement of stream flows for fish.

Regarding gravel mining, it is the expectation of the Plan that local governments will adopt controls through their critical area and land use ordinances to protect streams and rivers in the region from impacts such as gravel mining. The schedule and commitment of local governments to enact these controls will be detailed in the 6-Year Recovery Implementation Schedules. The plan also calls on WDFW to use its authorities to protect fish from the impacts of such projects as in-water gravel mining.

Regarding the use of models to evaluate habitat limiting factors, there are many credible approaches for evaluating salmon population status and selecting recovery measures. Each approach has strengths and weaknesses and must be used appropriately, and the limitations of any model must be considered in interpreting results. It is also common to apply multiple techniques to evaluate different aspects of the ecosystem. In some cases, applying multiple techniques provides multiple lines of evidence, thus reducing uncertainty.

The Ecosystem Diagnosis and Treatment (EDT) model was applied to listed Washington Lower Columbia River salmon and steelhead populations, in combination with other approaches, as a decision support tool to establish population performance goals and identify factors limiting recovery. The decision to use EDT was based on consideration of the benefits and drawbacks of EDT and other models and on specific circumstances in the Lower Columbia. Additional assessment techniques were used in addition to EDT as well. Planners also made efforts to reduce uncertainty in EDT modeling, to evaluate the uncertainty associated with EDT parameters, and to increase transparency of the model

and communicate assumptions (see the Plan, appendix E, for documentation of these efforts and for information on other assessment models used).

EDT provides results useful for evaluating population viability. It also allows for consistent comparisons among river basins and provides a comprehensive framework to organize and analyze available data to inform decision-making. The data compiled for EDT will continue to be refined as more data become available. Future EDT runs that contain more empirical data will be used to track the progress of recovery. The comprehensive database assembled for EDT can also be used to perform alternative analyses to corroborate the model and to reduce uncertainty. In addition, efforts are currently underway to test the model functions.

Considerable progress has been made throughout the Northwest in developing salmon population assessment techniques. Some of the most promising approaches are empirically based capacity models that rely on stream habitat data. Examples include the Oregon Coast Coho model. These techniques involve fewer assumptions, and their underlying functions are more transparent than EDT. However, they are data intensive, and Lower Columbia River basins are data poor. To make these and other approaches more viable, continued biological and physical monitoring is needed throughout the planning area.

All models benefit from careful review, evaluation, and examination of how to interpret results. As such information becomes available regarding EDT, we will continue to refine how we interpret and apply the results of the model, and we will continue to incorporate the results of new modeling efforts as they become available.

Several comments related to the Plan's general conceptual approaches. These included requests for clarification of the concept of balancing biological and social values, of the Plan's strategy for allocation of recovery burden, and of the "directional approach."

It is clear from the difference between current and desired status for the ESUs and component populations addressed by the Plan that substantial improvements are needed in multiple risk factors to achieve recovery. However, currently available analytical tools and data are not sufficient to identify with precision the exact type and extent of actions needed to fully address limiting factors and bring about needed improvements in ESU status. For example, we cannot identify how much riparian habitat must be protected or restored, how many culverts removed, or how much estuarine habitat restored to bring about the needed changes in population status.

Our tools and data do, however, allow us to make informed observations regarding the relationship of key life history stages to specific limiting factors and the relative significance of limiting factors to achieving recovery goals. Using this information we can establish priorities and begin to address the factors we believe are most limiting.

Over time, the results of research and monitoring will expand our knowledge of how fish respond to our actions and allow us to adapt our actions to better achieve the needed outcome.

This, in essence, is the directional approach of the Plan—to implement actions that address the threats and then monitor and adjust efforts over time as we learn what is working, what is not working, and what else is needed. As mentioned above, we believe that immediate actions can begin to address current risks and move toward recovery. Rather than delaying implementation until all technical issues are fully understood, we believe it is critical to proceed with informed and substantive recovery actions immediately.

To attain a sense of the relative sources of mortality, the Plan used a simple life-cycle model that estimated the percentage of manageable mortality being caused by seven impact sectors: freshwater habitat loss and degradation, estuarine habitat loss and degradation, predation, hydropower, harvest, and hatcheries. (For additional explanation of this model, see volume I, pages 5-29—5-36 and appendix E, chapter 10, of the Plan.) Then the Plan estimated the overall reduction in impacts needed to achieve the recovery goal for each listed population. Impact reduction targets were set for each of the impact sectors. The targets called for mortality impacts to be reduced by an equal percentage for each sector. For example, if it is estimated that an overall reduction of mortality of 50 percent is needed to achieve recovery of a population, each sector was targeted to reduce its impact by 50 percent. This allowed the burden of recovery to be spread equally across all impacts. Over time, we expect that monitoring will allow us to understand more accurately the relative significance of mortality sources, to assess progress in addressing them, and to adjust targets where justified.

The Plan also calls for “balancing of biological and social values,” and a commenter was concerned that this would lead to actions that failed to adequately address threats. The Plan is based on the presumption that all threats will be addressed in a technically sound manner. However, it also recognizes that public support is essential to a successful and sustainable recovery effort and that there may be multiple pathways to achieving the desired outcome. The Plan presents a set of actions that address all threats and relies on a framework of research, monitoring, and evaluation for continuing updates and refinements to goals, strategies, and actions. Plan actions are defined in such a way that there is considerable flexibility in determining how to implement actions and accomplish objectives. This approach provides the implementing partners with some flexibility in selecting an implementation pathway that will address threats in a scientifically sound manner while allowing consideration of social, cultural, and economic factors.

Some comments related to the plan’s treatment of the estuary, suggesting that the Plan should better address the threat posed by channel deepening and opportunities to develop an annual allocation of water that stimulates peak flow in the estuary; commentors also asked for clarification of the Plan’s hypothesis regarding uncertainty in understanding of the estuary and repeated findings that estuary is critical.

It is widely accepted among scientists that the Columbia River estuary plays a critical role in the life history of all Columbia Basin salmon and steelhead. The estuary provides the environment in which juvenile salmonids make their transition from a freshwater to a saltwater environment. While we are able to document changes in estuarine habitat over time, our knowledge of habitat forming processes and fish utilization of specific habitat types is limited. Based on the best available information and scientific expertise, the Plan sets forth a series of informed hypotheses regarding fish utilization of estuarine habitat and habitat needs. These hypotheses in turn are the basis for strategies and measures for protecting and restoring habitat. These hypotheses, strategies, and measures are intended to guide federal and state implementing partners in protecting and restoring estuary habitat and in undertaking research and monitoring to strengthen knowledge of estuary processes and fish needs. NMFS is building on this approach in developing an “estuary module” that will augment and support all Columbia Basin recovery planning efforts. Moreover, NMFS will continue to undertake and support research needed to address critical uncertainties in the estuary and Lower Columbia mainstem.

Comments related to harvest questioned whether the Plan unduly implies that harvest is no longer limiting recovery and suggested that the Plan should discuss specific examples of harvest management issues.

The plan does not indicate that harvest is no longer limiting recovery. It does document historical fishing patterns, which include fundamental changes in fishery management to protect listed wild fish. These changes have resulted in large reductions in fishing impacts, as documented in the Plan. The Plan also describes the potential for further reductions to impacts on listed wild fish from harvest. See for instance, volume I, chapter 5, which identifies reductions in fall Chinook fishery impacts that may be needed to reach population viability goals.

The Plan includes a variety of measures and actions intended to reduce harvest impacts and promote recovery. The state of Washington and NMFS have already implemented a wide range of such measures. Implementation of other measures will involve coordination and agreement among multiple state and federal agencies and several fishery regulatory processes including the Pacific Fishery Management Council, the Columbia River Compact, Pacific Salmon Commission, and the Washington Fish and Wildlife Commission. The Washington Department of Fish and Wildlife and NMFS have affirmed their commitments to working through the appropriate forums to address the Plan’s goals, strategies, and actions.

One comment recommended establishing refugia for wild fish. The plan explicitly recognizes the value of wild fish refugia and identifies specific refugia areas. Strategy H.S4 directs establishing some areas to be independent of hatchery influence. Specific areas are identified in volume I, section 6.7. It is the intent of the Plan that these areas be managed as wild fish refuges, free from both hatchery fish and harvest of wild fish.

NMFS supports this concept and will encourage the LCFRB to explore opportunities to expand the number of wild fish refugia.

Comments on monitoring and evaluation supported the Plan's framework and emphasized the need for leadership by NMFS to help ensure adequate funding and implementation of the Plan's recommendations. A commenter suggested that the final plan should include benchmarks for measuring success.

As described in the Plan, the LCFRB will convene a research, monitoring, and evaluation work group to develop and coordinate implementation of

- A coordinated interagency monitoring program that will track progress in achieving recovery goals and provide data needed to support decision-making by local, state, and federal implementation partners;
- A prioritized regional research agenda to address critical uncertainties;
- An adaptive management process.

The work group will identify the key recovery-related decisions that must be made, the information needed to make them, the type and quality of information already being collected, and information gaps. Based on this assessment a coordinated regional program for collecting, organizing, maintaining, and communicating data will be developed. NMFS will play an active role in this process, identifying the information needed to support its decisions relative to the status of the listed species and participating in designing and implementing the monitoring program.